REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of February 23, 2006.

Reconsideration of the Application is requested.

The Office Action

Claims 1, 7, 8, 21, 24-26, 28, and 30 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,611,838 issued to Ignat et al. Although the Examiner did not list claim 27 in paragraph 3 of the Office Action, the Examiner made reference to claim 27 in paragraph 11 and Applicants therefore assume that claim 27 stands rejected under the same grounds as the above-listed claims.

Claims 2-3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of U.S. Patent No. 6,643,652 issued to Helgeson et al.

Claim 4 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. in view of Helgeson et al., and further in view of U.S. Patent No. 6,782,383 issued to Subramaniam et al.

Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. in view of Helgeson et al., and in view of Subramaniam et al. as applied to claim 4, and further in view of U.S. Patent No. 6,934,696 issued to Williams et al.

Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 2, and further in view of Williams et al.

Claims 9, 11, and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of U.S. Patent No. 5,717,925 issued to Harper et al.

Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. in view of Harper et al. as applied to claim 9, and further in view of U.S. Patent No. 5,710,915 issued to McElhiney.

Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of U.S. Patent No. 6,629,091 issued to

Miura et al.

Claim 14 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of U.S. Patent No. 6,014,677 issued to Hayashi et al.

Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of Williams et al.

Claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of U.S. Patent No. 6,041,325 issued to Shah et al.

Claim 17 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. in view of Shah et al. as applied to claim 16, and further in view of Subramaniam et al.

Claims 18-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of Colbath et al. (U.S. Patent Application No. 2004/0199495).

Claim 20 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 1, and further in view of Dysart et al. (U.S. Patent Application No. 2004/0139070).

Claim 22 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 21, and further in view of Williams et al.

Claim 23 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. in view of Williams et al. as applied to claim 22, and further in view of Subramaniam et al.

Claim 29 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ignat et al. as applied to claim 28, and further in view of Miura et al.

The Art Rejections

Claims 1-20 are in Condition for Allowance

Independent claim 1, as amended, recites an abstraction layer for a database containing database records. Each record includes fields stored in one or more tables, the fields being associated with the record by a key disposed in at least one key column of each table. The abstraction layer includes a key column identifier identifying the key column, and one or more metadata tables containing metadata relating to the database. The metadata tables include at least: a controls table containing control records corresponding to fields of the database, the control record for each field including at least a control key associating the control record with the field and at least one metadatum corresponding to the field. The abstraction layer provides a database interface substantially independent of an underlying model of the database thereby providing extensible functionality for the database.

It is respectfully submitted that Ignat et al. does not anticipate this claim nor does it, together with the background described in the instant application, teach, suggest, or fairly disclose the features recited in the claim. More particularly, Ignat et al. does not teach an abstraction layer substantially independent of an underlying model of the database. For example, as described in col. 10, lines 25-45, the "metadata exchange 10 imports metadata into the metadata model 15 from one or more external sources 90 of metadata, such as data sources 100 and metadata sources 101" (underlining added). Further, "Metadata in an external source 90 is metadata in a format specific to the external source 90." In other words, the abstraction layers 104 and 106 as shown in Figure 5 are dependent on the external sources 90, including the data sources 100. On the other hand, the abstraction layer of the instant application is specifically intended to provide an interface substantially independent of the characteristics of the data sources as described on page 7, lines 11-13. For example, as described on page 7, lines 19-21, metadata is selected to provide the selected enhanced database interfacing functionality or, in other words, functionality not present or conceived of in the external data sources.

The substantial independence from characteristics of the data sources facilitates extended functionality not present in the data sources as described on page 7, lines 5-10,

such as, for example, multilingual user interfacing, increased flexibility in search patterning, enhanced user input data typing, conversion of monetary units or other unit conversions, and the like. Further, the extended functionality is not limited in scope to the original implementation but, instead, may be extended flexibly thereafter. For example, as described on page 18, lines 6-8, those skilled in the art can readily modify the controls table 52 of the abstraction layer 50 to provide additional or different metadata for selectively extending functionality of the database interface. Still further, as described on page 21, line 21 to page 22, line 4, the "abstraction layer 50 advantageously supports flexibility in the extension of accessibility of the database 10. For example, the multilingual tables of the abstraction layer 50 can support only selected languages, or only a single language, depending upon the specific application. The pattern table 80 can incorporate selected search patterns that solve search problems for a specific database implementation. Additional or modified data types, operators, database fields, and the like are also readily supported by modifications to corresponding metadata tables of the abstraction layer 50." This extensible functionality is not taught in the cited reference.

With reference to Figure 1 of the instant application, independent claim 1, as amended, recites a limitation such that the abstraction layer includes "one or more metadata tables containing metadata relating to the database." It is readily apparent that claim 1 recites a limitation for a simple, extensible, object-oriented abstraction layer structure where the component metadata tables can be modified to provide extended functionality. Ignat et al., on the other hand, with reference to Figures 2A, 2B, 4, and 5 describes a metadata exchange with complicated, almost spaghetti-like interactions between components such as, e.g., the metadata exchange 10 shown in Figure 4. The Examiner has not shown in the cited reference, any teaching or suggestion of such a simple, extensible abstraction layer design as presented in the instant application and recited in independent claim 1, as amended.

It is respectfully submitted, therefore, that the Ignat et al. patent does not teach each and every element of claim 1 in that it does not teach an abstraction layer independent in any substantial way of the data sources as recited in claim 1 of the instant application, as amended. Nor does it teach extended functionality for the external database in the

abstraction layer. And nor does it teach one or more metadata tables as part of an abstraction layer as recited in the subject claim. For at least the above reasons, it is respectfully submitted that independent claim 1 and claims 2-20 dependent therefrom are patentably distinct and unobvious over the art of record.

Claim 9, dependent from claim 1, was amended only to correct a minor grammatical error, replacing the expression "an type" with the correct expression "a type."

Claims 21-26 are in Condition for Allowance

Independent claim 21, as amended, recites a method for accessing a database containing database records. Each record including fields stored in one or more tables. Database access commands are formulated using metadata related to the database contained in an abstraction layer. The metadata for each database field is accessible using an abstraction layer control record, and the formulated database access command is used to access the database. The abstraction layer provides a database interface substantially independent of an underlying model of the database.

It is respectfully submitted that Ignat et al. does not anticipate this claim nor does it, together with the background described in the instant application, teach, suggest, or fairly disclose the features recited in the claim. More particularly, as with independent claim 1, as amended, Ignat et al. does not teach an abstraction layer substantially independent of an underlying model of the database. For example, as described in col. 10, lines 25-45, the "metadata exchange 10 imports metadata into the metadata model 15 from one or more external sources 90 of metadata, such as data sources 100 and metadata sources 101" (underlining added). Further, "Metadata in an external source 90 is metadata in a format specific to the external source 90." In other words, the abstraction layers 104 and 106 as shown in Figure 5 are dependent on the external sources 90, including the data sources 100. On the other hand, the abstraction layer of the instant application is specifically intended to provide an interface independent of the characteristics of the data sources as described on page 7, lines 11-13. For example, as described on page 7, lines 19-21, metadata is selected to provide the selected enhanced database interfacing functionality or, in other words, functionality not present or conceived of in the external data sources.

The independence from characteristics of the data sources facilitates extended functionality not present in the data sources as described on page 7, lines 5-10, such as, for example, multilingual user interfacing, increased flexibility in search patterning, enhanced user input data typing, conversion of monetary units or other unit conversions, and the like. Further, the extended functionality is not limited in scope to the original implementation but, instead, may be extended flexibly thereafter. For example, as described on page 18, lines 6-8, those skilled in the art can readily modify the controls table 52 of the abstraction layer 50 to provide additional or different metadata for selectively extending functionality of the database interface. Still further, as described on page 21, line 21 to page 22, line 4, the "abstraction layer 50 advantageously supports flexibility in the extension of accessibility of the database 10. For example, the multilingual tables of the abstraction layer 50 can support only selected languages, or only a single language, depending upon the specific application. The pattern table 80 can incorporate selected search patterns that solve search problems for a specific database implementation. Additional or modified data types, operators, database fields, and the like are also readily supported by modifications to corresponding metadata tables of the abstraction layer 50." This extensible functionality is not taught in the cited reference.

It is respectfully submitted, therefore, that the Ignat et al. patent does not teach each and every element of claim 21 of the instant application, as amended, in that it does not teach an abstraction layer independent in any meaningful way of the data sources as recited in the subject claim. For at least the above reasons, it is respectfully submitted that independent claim 21 and claims 22-26 dependent therefrom are patentably distinct and unobvious over the art of record.

Claim 26, dependent from claim 21, was amended only to use language consistent with claim 21, as amended, from which it depends. The transition term "including" was changed by amendment to read "comprising."

Claims 27-30 are in Condition for Allowance

Independent claim 27, as amended, recites an article of manufacture comprising

one or more program storage media readable by a computer and embodying an abstraction layer for facilitating accessing a database containing database records where each database record includes a plurality of fields stored in one or more tables. The abstraction layer includes a control table containing control records corresponding to database fields, each control record containing metadata associated with the corresponding database field. At least one additional table is included containing additional metadata, each database field being selectively associated with one or more selected portions of the additional metadata through metadata contained in the control record corresponding to the database field. <u>The abstraction layer provides a database interface substantially independent of an underlying model of the database</u>.

It is respectfully submitted that Ignat et al. does not anticipate this claim nor does it, together with the background described in the instant application, teach, suggest, or fairly disclose the features recited in the claim. More particularly, as with independent claims 1 and 21, as amended, Ignat et al. does not teach an abstraction layer substantially independent of an underlying model of the database. For example, as described in col. 10, lines 25-45, the "metadata exchange 10 imports metadata into the metadata model 15 <u>from one or more external sources 90 of metadata, such as data sources 100 and metadata sources 101</u>" (underlining added). Further, "Metadata in an external source 90 is metadata in a format specific to the external source 90." In other words, the abstraction layers 104 and 106 as shown in Figure 5 are dependent on the external sources 90, including the data sources 100. On the other hand, the abstraction layer of the instant application is specifically intended to provide an interface independent of the characteristics of the data sources as described on page 7, lines 11-13. For example, as described on page 7, lines 19-21, metadata is selected to provide the selected enhanced database interfacing functionality or, in other words, functionality not present or conceived of in the external data sources.

The independence from characteristics of the data sources facilitates extended functionality not present in the data sources as described on page 7, lines 5-10, such as, for example, multilingual user interfacing, increased flexibility in search patterning, enhanced user input data typing, conversion of monetary units or other unit conversions,

and the like. Further, the extended functionality is not limited in scope to the original implementation but, instead, may be extended flexibly thereafter. For example, as described on page 18, lines 6-8, those skilled in the art can readily modify the controls table 52 of the abstraction layer 50 to provide additional or different metadata for selectively extending functionality of the database interface. Still further, as described on page 21, line 21 to page 22, line 4, the "abstraction layer 50 advantageously supports flexibility in the extension of accessibility of the database 10. For example, the multilingual tables of the abstraction layer 50 can support only selected languages, or only a single language, depending upon the specific application. The pattern table 80 can incorporate selected search patterns that solve search problems for a specific database implementation. Additional or modified data types, operators, database fields, and the like are also readily supported by modifications to corresponding metadata tables of the abstraction layer 50." This extensible functionality is not taught in the cited reference.

It is respectfully submitted, therefore, that the Ignat et al. patent does not teach each and every element of claim 27 of the instant application, as amended, in that it does not teach an abstraction layer independent in any meaningful way of the data sources as recited in the subject claim. For at least the above reasons, it is respectfully submitted that independent claim 27 and claims 28-30 dependent therefrom are patentably distinct and unobvious over the art of record.

New Claims 31-34 are in Condition for Allowance

With reference to new claims 31-34, each of the subject claims recites limitations further defining and limiting the features of the respective base claims, as amended, with respect to the recited limitation regarding providing extended functionality for the database. The Examiner can find support for the recited limitations on page 8, lines 6-8, page 21, lines 21-22, and page 22, lines 3-4 of the instant application.

New claims 32-34 each recite a limitation regarding a modifiable exchange rate table. Support for these limitations can be found on page 16, line 15 through page 17, line 7.

CONCLUSION

In view of the above amendments, comments, and arguments presented, it is respectfully submitted that all pending claims (claims 1-34) are patentably distinct and unobvious over the references of record.

Allowance of all pending claims and early notice to that effect is respectfully requested.

Respectfully submitted,

FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP

23 MAY 06
Date

Michael E. Hudzinski
Reg. No. 34,185
1100 Superior Avenue, 7th Floor
Cleveland, Ohio 44114-2579
(216) 861-5582

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